National Institute of Environmental Health Sciences

Impact of two recent extreme heat episodes on morbidity and mortality in Adelaide, South Australia: A case-series analysis

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Abstract:

BACKGROUND: Extreme heatwaves occurred in Adelaide, South Australia, in the summers of 2008 and 2009. Both heatwaves were unique in terms of their duration (15 days and 13 days respectively), and the 2009 heatwave was also remarkable in its intensity with a maximum temperature reaching 45.7 degrees C. It is of interest to compare the health impacts of these two unprecedented heatwaves with those of previous heatwaves in Adelaide. METHODS: Using case-series analysis, daily morbidity and mortality rates during heatwaves (>/Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 35 degrees C for three or more days) occurring in 2008 and 2009 and previous heatwaves occurring between 1993 and 2008 were compared with rates during all non-heatwave days (1 October to 31 March). Incidence rate ratios (IRRs) were established for ambulance call-outs, hospital admissions, emergency department presentations and mortality. Dose response effects of heatwave duration and intensity were examined. RESULTS: Ambulance call-outs during the extreme 2008 and 2009 events were increased by 10% and 16% respectively compared to 4.4% during previous heatwaves. Overall increases in hospital and emergency settings were marginal, except for emergency department presentations in 2008, but increases in specific health categories were observed. Renal morbidity in the elderly was increased during both heatwaves. During the 2009 heatwave, direct heat-related admissions increased up to 14-fold compared to a three-fold increase seen during the 2008 event and during previous heatwaves. In 2009, marked increases in ischaemic heart disease were seen in the 15-64 year age group. Only the 2009 heatwave was associated with considerable increases in total mortality that particularly affected the 15-64 year age group (1.37; 95% CI, 1.09, 1.71), while older age groups were unaffected. Significant dose-response relationships were observed for heatwave duration (ambulance, hospital and emergency setting) and intensity (ambulance and mortality). CONCLUSIONS: While only incremental increases in morbidity and mortality above previous findings occurred in 2008, health impacts of the 2009 heatwave stand out. These findings send a signal that the intense and long 2009 heatwave may have exceeded the capacity of the population to cope. It is important that risk factors contributing to the adverse health outcomes are investigated to further improve preventive strategies.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3116460

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature: ☑

resource focuses on specific type of geography

Urban

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Injury, Mental Health/Stress, Morbidity/Mortality, Neurological Effect, Respiratory Effect, Urologic Effect, Other Health Impact

Cardiovascular Effect: Heart Attack

Mental Health Effect/Stress: Other Mental Disorder

Respiratory Effect: Other Respiratory Effect

Respiratory Condition (other) : respiratory disease morbidity

Other Health Impact: heat related morbidity ;

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Children, Elderly

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified